

What is claimed is:

1. A flexible multilayer packaging film comprising:
 - (a) a first film layer, a second film layer, a third film layer, and a fourth film layer, wherein said first film layer comprises a first biaxially-oriented polymer and said first film layer has an internal surface and an opposing external surface, wherein said external surface of said first film layer comprises a surface-roughened portion on an external surface of said packaging film;
 - (b) wherein said second film layer comprises an adhesive and is positioned between said second film layer and said third film layer;
- 10 (c) wherein said third film layer comprises a barrier material and is positioned between said second film layer and said fourth film layer of said film, wherein said barrier material is selected from the group consisting of polyvinyl alcohol, ethylene vinyl alcohol copolymer, polyvinyl chloride, polyvinylidene chloride, polyvinylidene chloride/methyl acrylate copolymer, polyamide, high density polyethylene, metals, metal oxides, organometallic compounds, ceramics and mixtures thereof;
- 15 (d) wherein said fourth film layer comprises a second biaxially-oriented polymer and said fourth film layer has an internal surface and an opposing external surface, wherein said external surface comprises at least one score-line; and
- (e) wherein said surface-roughened portion and said score-line intersect at least one axis drawn between both said first film layer and said fourth film layer wherein said at least one axis is perpendicular to the plane of said first film layer or said fourth film layer when said film is positioned in a lay flat condition.
2. A flexible multilayer packaging film according to Claim 1, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-10% at 85° C. as measured in accordance with ASTM D-2732-96.
- 25 3. A flexible multilayer packaging film according to Claim 2, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-5% at 85° C. as measured in accordance with ASTM D-2732-96.
4. A flexible multilayer packaging film according to Claim 1, further comprising a fifth film layer positioned between said third film layer and said fourth film layer, wherein said fifth film layer comprises an adhesive.

5. A flexible multilayer packaging film according to Claim 1, wherein said at least one score-line of said fourth film layer has a depth of from about 50-95% of the thickness of said fourth film layer.

6. A flexible multilayer packaging film according to Claim 1, wherein said at least 5 one score-line is continuous.

7. A flexible multilayer packaging film according to Claim 1, wherein said at least one score-line is non-continuous.

8. A flexible multilayer packaging film according to Claim 1, wherein said at least one score-line is formed by optical ablation.

10 9. A flexible multilayer packaging film according the Claim 1, wherein both said first biaxially-oriented polymer and said second biaxially-oriented polymer are selected from the group consisting of a polyester, a polyolefin, a polyamide, and a blend thereof.

15 10. A flexible multilayer packaging film according the Claim 1, wherein both said first biaxially-oriented polymer and said second biaxially-oriented polymer are selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide, and a blend thereof.

11. A flexible multilayer packaging film according the Claim 1, wherein both said first biaxially-oriented polymer and said second biaxially-oriented polymer are the same biaxially-oriented polymer.

20 12. A flexible multilayer packaging film according to Claim 1, wherein said barrier material is an oxygen barrier and said film has an oxygen transmission rate of from about 0.01-1.00 cm³/100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM D-3985-81 test method.

25 13. A flexible multilayer packaging film according to Claim 1, wherein said barrier material is a water vapor barrier and said film has a water vapor transmission rate of from about 0.01-1.00 g./100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM F-1249 test method.

30 14. A flexible multilayer packaging film according the Claim 1, wherein said barrier material is a metallic coating on said external surface of said fourth film layer wherein said metallic coating has a thickness of from about 200-700 Å.

15. A flexible multilayer packaging film according to Claim 14, wherein said metallic coating is a material selected from the group consisting of metal, metallic oxide, organometallic compounds, ceramic and mixtures thereof.

16. A flexible multilayer packaging film according the Claim 15, wherein said 5 metallic coating comprises aluminum, zinc, nickel, copper, bronze, gold, silver, tin, or alloys thereof.

17. A flexible multilayer packaging film according the Claim 1, wherein said external surface of said fourth film layer further comprises a cold-seal adhesive.

18. A flexible multilayer packaging film according the Claim 1, wherein said first 10 film layer is an outer film layer.

19. A flexible multilayer packaging film according the Claim 1, wherein said fourth film layer is an inner film layer.

20. A flexible multilayer packaging film according the Claim 1, wherein said film has a thickness of from about 0.75-3.5 mils.

15 21. A flexible multilayer packaging film according the Claim 1, wherein said film forms a package comprising;

(a) a tear-initiation area;

(b) a directional tear zone;

20 (c) at least one first folded side edge, a top first seal edge portion and an opposite bottom second seal edge portion in parallel with said bottom second seal edge portion, and a third seal portion disposed perpendicular between said top first seal edge portion and said bottom second seal edge portion and parallel to said at least one first folded side edge; and

(d) wherein said at least one first folded side edge is superimposed on said surface-roughened portion on an external surface of said first film layer of said package.

25 22. A package according the Claim 21, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a cold-seal.

23. A package according the Claim 21, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a heat-seal.

24. A flexible multilayer packaging film comprising;

(a) a first film layer, a second film layer, a third film layer, and a fourth film layer, wherein said first film layer comprises a first biaxially-oriented polymer selected from the group consisting of a polyester, a polyolefin, a polyamide and a blend thereof, and said first film layer has an internal surface and an opposing external surface, wherein said first film layer comprises a surface-roughened portion on an external surface of said first film layer;

(b) wherein said second film layer comprises an adhesive and is positioned between said second film layer and said third film layer;

(c) wherein said third film layer comprises a barrier material and is positioned between said second film layer and said third film layer of said film, said barrier material is a metallic coating having a thickness of from about 200-700 Å;

(d) wherein said fourth film layer comprises a second biaxially-oriented polymer selected from the group consisting of a polyester, a polyolefin, a polyamide and a blend thereof, said fourth film layer has an internal surface and an opposing external surface, wherein said external surface includes at least one score-line; and

(e) wherein said surface-roughened pattern and said score-line intersect at least one axis drawn between both said first film layer and said fourth film layer wherein said at least one axis is perpendicular to the plane of said first film layer or said fourth film layer when said film is positioned in a lay flat condition.

25. A flexible multilayer packaging film according to Claim 24, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-10% at 85° C. as measured in accordance with ASTM D-2732-96.

26. A flexible multilayer packaging film according to Claim 25, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-5% at 85° C. as measured in accordance with ASTM D-2732-96.

27. A flexible multilayer packaging film according to Claim 25, further comprising a fifth film layer positioned between said third film layer and said fourth film layer, wherein said fifth film layer is an adhesive.

28. A flexible multilayer packaging film according to Claim 25, wherein said at least one score-line has a depth of from about 50-95% of the thickness of said fourth film layer.

29. A flexible multilayer packaging film according to Claim 25, wherein said at least one score-line is continuous.

30. A flexible multilayer packaging film according to Claim 25, wherein said at least one score-line is non-continuous.

5 31. A flexible multilayer packaging film according to Claim 25, wherein said at least one score-line is formed by optical ablation.

32. A flexible multilayer packaging film according the Claim 25, wherein both said first biaxially-oriented polymer and said second biaxially-oriented polymer are selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide and
10 a blend thereof.

33. A flexible multilayer packaging film according the Claim 25, wherein said first biaxially-oriented polymer and said second biaxially-oriented polymer are the same biaxially-oriented polymer.

34. A flexible multilayer packaging film according to Claim 25, wherein said barrier
15 material is an oxygen barrier and said film has an oxygen transmission rate of from about 0.01-1.00 cm³/100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM D-3985-81 test method.

35. A film according to Claim 25, wherein said barrier material is a water vapor barrier and said film has a water vapor transmission rate of from about 0.01-1.00 g./100 in.²
20 (0.1550-15.50 cm³/m²) as measured in accordance with ASTM F-1249 test method.

36. A flexible multilayer packaging film according to Claim 25, wherein said metallic coating is a material selected from the group consisting of metal, metal oxide, organometallic, ceramic and mixtures thereof.

37. A flexible multilayer packaging film according to Claim 36, wherein said
25 metallic coating is a material selected from the group consisting aluminum, zinc, nickel, copper, bronze, gold, silver, tin, or alloys thereof.

38. A flexible multilayer packaging film according the Claim 25, wherein said first film layer is an outer film layer and said fourth film layer is an inner film layer.

39. A flexible multilayer packaging film according the Claim 25, wherein said film forms a package comprising;

(a) a tear-initiation area;

(b) a directional tear zone;

5 (c) at least one first folded side edge, an top first seal edge portion and an opposite bottom second seal edge portion in parallel with said top first seal edge portion, and a third seal portion disposed perpendicular between said top first seal edge portion and said bottom second seal edge portion and parallel with said at least one first folded side edge; and

(d) wherein said first folded side edge is superimposed on said surface roughening of

10 said first film layer of said packaging film.

40. A package according the Claim 39, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a cold-seal.

41. A package according the Claim 39, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a heat-seal.

15 42. A flexible multilayer packaging film comprising;

(a) a first film layer, a second film layer, a third film layer, and a fourth film layer, wherein said first film layer comprises at least a first biaxially-oriented polymer selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide, and a blend thereof, and said first film layer is an outer film layer and said first film layer has an internal surface and an opposing external surface, wherein said external surface of said first film layer comprises a surface-roughened portion;

20 (b) wherein said second film layer comprises an adhesive and is positioned between said second film layer and said third film layer;

(c) wherein said third film layer comprises a barrier material and is positioned between said second film layer and said fourth film layer of said film, said barrier material is a metallic coating on said external surface of said third film layer, wherein said metallic coating has a thickness of from about 200-700 Å and said metallic coating is a material selected from the group consisting of metal, metal oxide, organometallic, ceramic and mixtures thereof and;

5 (d) wherein said fourth film layer comprises a second biaxially-oriented polymer selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide, and a blend thereof, said fourth film layer is an inner film layer and said fourth film layer has an internal surface and an opposing external surface, wherein said external surface comprises at least one score-line; and

10 (e) wherein said surface-roughened portion and said score-line intersect at least one axis drawn between both said first film layer and said fourth film layer wherein said at least one axis is perpendicular to the plane of said first film layer or said fourth film layer when said film is positioned in a lay flat condition.

15 43. A flexible multilayer packaging film according to Claim 42, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-10% at 85° C. as measured in accordance with ASTM D-2732-96.

10 44. A flexible multilayer packaging film according to Claim 43, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-5% at 85° C. as measured in accordance with ASTM D-2732-96.

15 45. A flexible multilayer packaging film according to Claim 42, further comprising a fifth film layer positioned between said third film layer and said fourth film layer, wherein said fifth film layer is an adhesive.

20 46. A flexible multilayer packaging film according to Claim 42, wherein said at least one score-line has a depth of from about 50-95% of the thickness of said fourth film layer.

47. A flexible multilayer packaging film according to Claim 42, wherein said at least one score-line is continuous.

48. A flexible multilayer packaging film according to Claim 42, wherein said at least one score-line is non-continuous.

25 49. A flexible multilayer packaging film according to Claim 42, wherein said at least one score-line is formed by optical ablation.

50. A flexible multilayer packaging film according to Claim 42, wherein both said first biaxially-oriented polymer and said second biaxially-oriented polymer are the same biaxially-oriented polymer.

51. A flexible multilayer packaging film according to Claim 42, wherein said barrier material is an oxygen barrier and said film has an oxygen transmission rate of from about 0.01-1.00 cm³/100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM D-3985-81 test method.

5 52. A flexible multilayer packaging film according to Claim 42, wherein said barrier material is water vapor barrier and said film has a water vapor transmission rate of from about 0.01-1.00 g./100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM F-1249 test method.

10 53. A flexible multilayer packaging film according to Claim 42, wherein said metallic coating is a material selected from the group consisting of aluminum, zinc, nickel, copper, bronze, gold, silver, tin, or alloys thereof.

54. A package comprising; /

(a) a flexible multilayer packaging film comprising;

15 (i) a first film layer, a second film layer, a third film layer, and a fourth film layer, wherein said first film layer comprises at least a first biaxially-oriented polymer selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide, and a blend thereof, said first film layer is an outer film layer and said first film layer has an internal surface and an opposing external surface, wherein said external surface of said first film layer comprises a surface-roughened portion;

20 (ii) wherein said second film layer comprises an adhesive and is positioned between said first film layer and said third film layer;

(iii) wherein said third film layer comprises a barrier material and is positioned between said second film layer and said fourth film layer of said film, wherein said barrier material is a metallic coating on said internal surface of said fourth film layer, wherein said 25 metallic coating has a thickness of from about 200-700 Å and said metallic coating is a material selected from the group consisting of metal, metal oxide, organometallic, ceramic and mixtures thereof;

5 (iv) wherein said fourth film layer comprises a second biaxially-oriented polymer selected from the group consisting of a polyethylene terephthalate, a polypropylene, a polyamide, and a blend thereof, said fourth film layer is an inner film layer and said fourth film layer has an internal surface and an opposing external surface, wherein said external surface includes at least one score-line;

10 (b) wherein said package further comprises at least one first folded side edge, a top first seal edge portion and an opposite bottom second seal edge portion in parallel with said top first seal edge portion, and a third seal portion disposed perpendicular between said first seal edge portion and said bottom second seal edge portion and parallel with said at least one first folded side edge;

(c) a tear-initiation area;

(d) a directional tear zone; and

(e) wherein said first folded side edge is superimposed on said surface roughening portion of said first film layer of said packaging film.

15 55. A package according to Claim 54, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-10% at 85° C. as measured in accordance with ASTM D-2732-96.

20 56. A package according to Claim 55, wherein said film has an unrestrained linear thermal shrinkage in the machine direction and transverse direction of between 0-5% at 85° C. as measured in accordance with ASTM D-2732-96.

57. A package according to Claim 54, wherein said film further comprises a fifth film layer positioned between said third film layer and said fourth film layer, wherein said fifth film layer is an adhesive.

25 58. A package according to Claim 54, wherein said barrier material is an oxygen barrier and said film has an oxygen transmission rate of from about 0.01-1.00 cm³/100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM D-3985-81 test method.

59. A package according to Claim 54, wherein said barrier material is a water vapor barrier and said film has a water vapor transmission rate of from about 0.01-1.00 g./100 in.² (0.1550-15.50 cm³/m²) as measured in accordance with ASTM F-1249 test method.

60. A package according to Claim 54, wherein said metallic coating a material selected from the group consisting aluminum, zinc, nickel, copper, bronze, gold, silver, tin, or alloys thereof.

61. A package according to Claim 54, wherein said at least one score-line has a depth 5 of from about 50-95% of the thickness of said fourth film layer.

62. A package according to Claim 54, wherein said at least one score-line is continuous.

63. A package according to Claim 54, wherein said at least one score-line is non-continuous.

10 64. A package according to Claim 54, wherein said at least one score-line is formed by optical ablation.

65. A package according the Claim 54, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a cold-seal.

15 66. A package according the Claim 54, wherein said top first seal edge portion, said bottom second seal edge portion, or said third seal edge portion includes a heat-seal.

67. A package according the Claim 54, further comprising a second folded side edge opposite and parallel to said at least one first folded side edge.